4.2 AIR QUALITY

This section discusses the existing air quality conditions that occur within the Project region and site. This section also identifies significance criteria, assesses potential Project-related impacts to existing air quality conditions, and identifies mitigation measures that are designed to reduce or eliminate adverse impacts.

4.2.1 Environmental Setting

Ambient air quality is influenced by the climate, meteorology, and topography of an area along with the quantity and type of pollutants released to the air. This section describes climate and air quality characteristics of the South Central Coast Air Basin, an area that includes San Luis Obispo County and the portion of Santa Barbara County north of the Santa Ynez Mountain ridgeline.

Climate and Meteorology

The proposed Project is located in San Luis Obispo County (on the central coast of California) in the South Central Coast Air Basin. Summers are mild and typically characterized by early morning and afternoon fogs. Winters are usually cool and wet with the rainy season extending from late November to early April.

Airflow plays an important role in the movement and dispersion of air pollutants in the San Luis Obispo region. The speed and direction of local winds are controlled by (1) the location and strength of the Pacific High pressure system and other global patterns, (2) topographical factors, and (3) circulation patterns resulting from temperature differences between land and sea.

During the spring and summer when the Pacific High attains its greatest strength, onshore winds from the northwest generally prevail during the day. As evening approaches, onshore winds are reduced, and the wind direction reverses with winds flowing down the coastal mountain and valleys to form light easterly breezes.

In the fall, onshore surface winds decline and the marine layer becomes shallow, allowing for an occasional reversal to a weak offshore flow. This, along with the diurnal alteration of land-sea breeze circulation, can sometimes produce a "sloshing" effect. Under such conditions, pollutants may accumulate over the Pacific Ocean and subsequently be carried back onshore with the return of sea breezes.

In the atmosphere, air temperatures normally decrease as altitude increases. At varying distances above the earth's surface, however, a reversal of this temperature

gradient can occur. Such a condition, which is called an inversion, is simply a warm layer of air over a layer of cooler air. Inversions can have the effect of limiting the vertical dispersion of air pollutants, trapping them near the earth's surface.

Several types of inversions are common to the San Luis Obispo area. Weak surface inversions are caused by radiational cooling of air in contact with the cold surface of the earth at night. In valleys and low-lying areas, this condition is intensified by the addition of cold air flowing down from hills and pooling in valleys. Surface inversions are common throughout San Luis Obispo County during winter months, particularly on cold mornings. As the morning sun warms the surface of the earth and air near the ground, the inversion layer lifts, gradually dissipating throughout the day.

During the summer, subsidence inversions can occur when the presence of the Pacific high pressure cell can cause the air mass aloft to sink. As the air descends, compression heating warms the air to a higher temperature than the air below. This highly stable atmospheric conditioning can act as a nearly impenetrable lid to the vertical mixing of pollutants. Subsidence inversions can persist for one or more days, causing air stagnation and the buildup of pollutants.

Air Quality Measurement

Air quality is determined by measuring ambient concentrations of air pollutants that are known to cause adverse health effects. For regulatory purposes, air pollutants are generally recognized as “criteria pollutants” or as “toxic air pollutants” (or hazardous air pollutants). For most criteria pollutants, regulations and standards have been in effect for more than 20 years, and control strategies are designed to ensure that the ambient concentrations do not exceed certain thresholds. For toxic air emissions, however, the regulatory process usually assesses the potential impacts to public health in terms of “risk” (such as the Air Toxics “Hot Spots” Program in California), and emissions are usually controlled by prescribed technologies.

Criteria Pollutants

Criteria pollutants that are considered to be inert (those that do not react chemically, but preserve the same chemical composition from point of emission to point of impact), include carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter with a diameter of 10 microns or less (PM_{10}) and 2.5 microns or less ($PM_{2.5}$), lead (Pb), sulfates (SO_4), and hydrogen sulfide (H_2S).

Carbon monoxide is primarily formed through the incomplete combustion of organic fuels. Higher CO values are generally measured during winter when dispersion is limited by morning surface inversions. Seasonal and diurnal variations in meteorological conditions lead to lower values in summer and in the afternoon.

Ozone is formed in the atmosphere through a series of complex photochemical reactions involving oxides of nitrogen (NO_x), reactive organic gases (ROG), and sunlight occurring over several hours. Since ozone is not emitted directly into the atmosphere, but is formed as a result of photochemical reactions, it is classified as a secondary or regional pollutant. Because these ozone-forming reactions take time, peak ozone levels are often found downwind of major source areas.

Ambient air quality standards have been set for two classes of particulate matter: PM_{10} (coarse particulate matter less than 10 microns in aerodynamic diameter) and $PM_{2.5}$ (fine particulate matter 2.5 microns or less in aerodynamic diameter). Both consist of different types of particles suspended in the air, such as: metal, soot, smoke, dust and fine mineral particles. Depending on the source of particulates, toxicity and chemical activity can vary. Particulate matter is a health concern because when inhaled it can cause permanent damage to the lungs. The primary source of PM_{10} emissions appears to be soil via roads, construction, agriculture, quarries and natural windblown dust. Other sources of PM_{10} include sea salt, particulate matter released during combustion processes, such as those in gasoline or diesel vehicles, and wood burning. Fugitive emissions from construction sites, wood stoves, fireplaces and diesel truck exhaust are primary sources of $PM_{2.5}$. Both sizes of particulates can be dangerous when inhaled; however, $PM_{2.5}$ tends to be more damaging because it remains in the lungs once it is inhaled.

Nitric oxide (NO) is a colorless gas formed during combustion processes which rapidly oxidize to form NO_2, a brownish gas. The highest nitrogen dioxide values are generally measured in urbanized areas with heavy traffic.

Existing Air Quality

The United States (U.S.) Environmental Protection Agency (EPA) has designated all areas of the U.S. as having either air quality better than (attainment) or worse than (nonattainment) the National Ambient Air Quality Standards (NAAQS). The NAAQS are federal air quality standards established under the Clean Air Act (CAA). The CAA also mandates that the state submit and implement a State Implementation Plan (SIP) for local areas not meeting those standards. The plans must include pollution control

measures that demonstrate how the standards will be met. "Non-attainment" areas are further categorized as either: marginal, moderate, serious, severe or extreme, depending upon the numerical exceedance of the priority pollutant standard and the measures that are in place to reduce these pollutant levels. These designations are specific to the area and the pollutant. Because the local air basin does not meet State standards for O_3 and inhalable particulate matter (PM_{10}), San Luis Obispo County is considered a state nonattainment area for those pollutants; however, the air basin is considered to be in attainment for $PM_{2.5}$, CO, NO_2, and SO_2. Table 4.2-1 lists Federal and state attainment status for the San Luis Obispo County Air Pollution Control District (APCD) portion of the South Central Coast Air Basin.

Table 4.2-1. Federal and State Attainment Status for San Luis Obispo County APCD Portion of the South Central Coast Air Basin

Pollutants	Federal Classification	State Classification
O_3 (1-hour standard)	Classification revoked June 2005	Moderate Nonattainment
O_3 (8-hour standard)	Unclassified/Attainment	Nonattainment
PM_{10}	Unclassified	Nonattainment
$PM_{2.5}$	Unclassified/Attainment	Attainment
CO	Unclassified/Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment

Source: California Air Resources Board
Area Designation Maps State/National
Updated 9/11/07

The San Luis Obispo County APCD maintains a network of air quality monitoring stations located throughout the county. The permanent monitoring station that is closest to the Project site is the Morro Bay Station, which is located approximately 5.0 miles (8.0 km) north of Montaña de Oro State Park. Most criteria pollutants are monitored at the Morro Bay Station, including O_3, NO, NO_2, NO_X, and PM_{10}. A summary of monitoring data for the last three most recent years (2004 to 2006) is included in Table 4.2-2. The closest CO monitoring station to the site is the San Luis Obispo Station, which is, located inland of the Project area. CO monitoring data from this station is included in Table 4.2-2; however, it should be noted that monitoring of CO at this station was discontinued in November of 2006. Monitoring data, shown in Table 4.2-2, show the following pollutant trends: neither state nor national O_3 standards were exceeded during the three-year reporting period. CO and NO_2 concentrations are low, with no recorded exceedances during that reporting period. Particulate (PM_{10} and

$PM_{2.5}$) concentrations are largely affected by meteorology and show some variability and that the national $PM_{2.5}$ standard was not exceeded during the reporting period.

Table 4.2-2. Air Quality Data from the Project Area

Pollutant Standards	2004	2005	2006
Ozone (O_3)			
State standard (1-hour average = 0.09 ppm)[a]			
National standard (8-hour average = 0.08 ppm)			
Maximum concentration 1-hour period (ppm)	0.074	0.073	0.063
Maximum concentration 8-hour period (ppm)	ND[b]	ND	0.056
Days state 1-hour standard exceeded	0	0	0
Days national 8-hour standard exceeded	0	0	0
Carbon Monoxide (CO)[c]			
State standard (8-hour average = 9 ppm)			
National standard (8-hour average = 9 ppm)			
Maximum concentration 8-hour period (ppm)	2.6	2.6	1.1
Days state/national 8-hour standard exceeded	0	0	0
Nitrogen Dioxide (NO_2)			
State standard (1-hour average = 0.18 ppm)			
Maximum 1-hour concentration	0.044	0.047	0.046
Days state standard exceeded	0	0	0
Suspended Particulates (PM_{10})[d, e]			
State standard (24-hour average = 50 $\mu g/m^3$)[e]			
National standard (24-hour average = 150 $\mu g/m^3$)			
Maximum 24-hour concentration ($\mu g/m^3$)	42.0	44.0	60.0
Annual arithmetic mean 24-hour concentration ($\mu g/m^3$)	18.0	16.3	16.1
Days exceeding state standard	0	0	6[b]
Days exceeding national standard	0	0	0
Suspended Particulates ($PM_{2.5}$)[d, e]			
National standard (24-hour average = 35 $\mu g/m^3$)			
Maximum 24-hour concentration ($\mu g/m^3$)	19.5	18.6	24.2
Days exceeding national standard	0	0	0

Data obtained from the Morro Bay monitoring station.

[a] Parts per million has been abbreviated to ppm.

[b] ND represents Not Detected

[c] CO and $PM_{2.5}$ data are from San Luis Obispo monitoring station, the next most proximate monitoring station.

[d] PM_{10} sampling occurs every six days, therefore a single PM_{10} exceedence is statistically equated to six exceedance days.

[e] Microgram per cubic meter has been abbreviated to $\mu g/m^3$.

Source: San Luis Obispo County Annual Air Quality Monitoring Reports 2004 - 2006. Available for download from <http://www.slocleanair.org/air/annualreport.asp>.

Global Climate Change

Global climate change (GCC) is a change in the average weather of the earth, which can be measured by wind patterns, storms, precipitation, and temperature. Although the issue of GCC is a widely accepted theory, the extent of the change from anthropogenic (human activity-related) sources remains in debate.

Gases that trap heat in the atmosphere are often called greenhouse gases (GHG), analogous to the way in which a greenhouse retains heat. Common GHG include water vapor, carbon dioxide, methane, nitrous oxides, chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, ozone, and aerosols. GHG are emitted by both natural processes and human activities, and the accumulation of GHG in the atmosphere regulates the earth's temperature. Without the natural heat trapping effect of GHG, the earth's surface would be about 34 degrees Centigrade (°C) cooler. However, it is believed that emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations.

In 2006, the California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006. AB 32 focuses on reducing GHG in California. GHG as defined under AB 32 includes: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. AB 32 requires the California Air Resources Board (CARB), the State agency charged with regulating statewide air quality, to adopt rules and regulations that would achieve GHG emissions equivalent to statewide levels in 1990 by 2020. On August 22, 2007, the CARB completed a draft GHG baseline (1990-2004) inventory, and has proposed a target GHG emission level for 2020. The CARB is also working on a Scoping Plan specifying measures to reduce GHG emissions from multiple sector-specific activities.

At this time, the CEQA Guidelines do not provide any regulatory guidance on how to address potential impacts of global climate change, and AB 32 defers CEQA consideration of GHG as a subsequent phase of this legislation. AB 32 also directs the CARB as the agency to determine appropriate measures to mitigate for GHG, which may or may not include measures directed at new land use development subject to CEQA. Pursuant to Senate Bill 97, the Governor's Office of Planning and Research is in the process of developing CEQA guidelines to mitigate GHG emissions or the effects of GHG emissions. These GHG CEQA guidelines must be transmitted to the Resources Agency and adopted by January 1, 2010.

4.2.2 Regulatory Setting

This section identifies and discusses the regulations and policies pertaining to air quality that are administered by Federal, state and local agencies. A number of statutes, regulations, plans, and policies have been adopted that address air quality issues. The proposed Project site and vicinity are subject to air quality regulations developed and implemented at the Federal, state, and local levels. At the Federal level, the EPA is responsible for implementation of the Federal CAA. Some portions of the CAA (e.g., certain mobile-source and other requirements) are administered directly by the EPA. Other portions of the CAA (e.g., stationary-source requirements) are administered by state and local agencies. A number of plans and policies have been adopted by various agencies that address air quality concerns. Those plans and policies relevant to the proposed Project are discussed below.

Federal Regulations

Federal Clean Air Act

The CAA was first enacted in 1955 and has been amended numerous times in subsequent years (1963, 1965, 1967, 1970, 1977, and 1990). The CAA establishes Federal air quality standards, known as National Ambient Air Quality Standards (NAAQS), and specifies future dates for achieving compliance. The CAA also mandates that the state submit and implement a State Implementation Plan (SIP) for local areas not meeting those standards. The plans must include pollution control measures that demonstrate how the standards will be met.

The 1990 amendments to the CAA identify specific emission-reduction goals for areas not meeting the NAAQS. These amendments require both a demonstration of reasonable further progress toward attainment and incorporation of additional sanctions for failure to attain or meet interim milestones. The sections of the CAA that would most substantially affect the development of the proposed Project include Title I (Nonattainment Provisions) and Title II (Mobile-Source Provisions).

Title I provisions were established with the goal of attaining the NAAQS for criteria pollutants. Table 4.2-3 shows the NAAQS currently in effect for each criteria pollutant. The NAAQS were amended in July 1997 to include an 8-hour standard for O_3 and to adopt a NAAQS for fine particulate matter ($PM_{2.5}$).

Table 4.2-3. Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS[a]	NAAQS[b]
Ozone (O_3)	1 hour	0.09 ppm[c]	--
	8 hour	0.07 ppm	0.075 ppm
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm
	8 hour	9.0 ppm	9 ppm
Nitrogen Dioxide (NO_2)	1 hour	0.18 ppm	--
	Annual	0.030 ppm	0.053 ppm
Sulfur Dioxide (SO_2)	1 hour	0.25 ppm	--
	3 hour	--	0.5 ppm
	24 hour	0.04 ppm	0.14 ppm
	Annual	--	0.030 ppm
Inhalable Particulate Matter (PM_{10})	24 hour	50 $\mu g/m^3$ [c]	150 $\mu g/m^3$
	Annual	20 $\mu g/m^3$	--
Fine Particulate Matter ($PM_{2.5}$)	24 hour	--	35 $\mu g/m^3$
	Annual	12 $\mu g/m^3$	15 $\mu g/m^3$

Notes:

[a] The CAAQS for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, and $PM_{2.5}$ are values not to be exceeded. All other California standards shown are values not to be equaled or exceeded.

[b] NAAQS, other than O_3 and those based on annual averages, are not to be exceeded more than once a year. The O_3 standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

[c] ppm = parts per million by volume; $\mu g/m^3$ = micrograms per cubic meter.

Source: California Air Resources Board, February 22, 2007.

State Regulations

Heavy Duty Diesel Truck Idling Regulation

The California Air Resource Board (CARB) Heavy Duty Diesel Truck Idling rule became effective on February 1, 2005, and prohibits heavy-duty diesel trucks from idling for longer than five minutes at a time. Truck idling for longer than five minutes while queuing is allowed, however, provided the queue is located beyond 100 feet (30 meters [m]) from any homes or schools (CARB 2006).

California Diesel Fuel Regulations

This rule sets sulfur limitations for diesel fuel sold in California for use in on-road and off-road motor vehicles (CARB 2004). Harbor craft were originally excluded from the rule, but were later included by a 2004 rule amendment (CARB 2005a). Under this rule, diesel fuel used in motor vehicles except harbor craft has been limited to 500 parts per million (ppm) sulfur since 1993. The sulfur limit was reduced to 15 ppm beginning

September 1, 2006. (A Federal diesel rule similarly limited sulfur content nationwide for on-road vehicles to 15 ppm beginning October 15, 2006.)

Statewide Portable Equipment Registration Program (PERP)

The PERP establishes a uniform program to regulate portable engines and portable engine-driven equipment units (CARB 2005b). Once registered in the PERP, engines and equipment units may operate throughout California without the need to obtain individual permits from local air districts. The PERP generally would apply to shore end and land-based construction equipment such as generators, compressors and power winches.

California Global Warming Solutions Act of 2006 (AB 32)

The California Global Warming Solutions Act requires that the state cap GHG emissions at 1990 levels by the year 2020. The Act requires that CARB establish a program for State-wide GHG emission reporting and to monitor and enforce compliance with the program. The regulatory steps established by AB 32 required CARB to:

- Adopt early action measures to reduce GHG emissions;
- Establish a state-wide GHG emissions cap for the year 2020 based on 1990 emissions levels;
- Develop mandatory reporting rules for significant sources of GHG emissions;
- Adopt a scoping plan indicating how emissions reductions will be achieved via regulations, market mechanisms and other actions; and
- Adopt the regulations needed to achieve the maximum technologically feasible and cost-effective reductions in GHG's.

Local Regulations

San Luis Obispo Air Pollution Control District (APCD)

The APCD is the local agency in San Luis Obispo County primarily responsible for attaining the air quality standards established by the California Air Resources Board and the EPA. The APCD implements programs and regulations to control air pollution released from stationary sources within the District, as well as implementing programs to encourage alternative means of transportation. In 2003, the APCD published a

CEQA Air Quality Handbook to help local governments analyze and mitigate project-specific air quality impacts. This handbook provides standards, methodologies, and procedures for conducting air quality analyses in environmental impact reports and was used extensively in the preparation of this assessment. The APCD has established CEQA thresholds for the emissions of air pollutants by construction activities. The established threshold for Best Available Control Technology (BACT) for construction equipment is 185 pounds per day of ROG or NO_x, or 2.5 tons of ROG or NO_x during a calendar quarter. If these thresholds are exceeded, mitigation measures, including offsets, may be required.

Through the attainment planning process, the APCD developed the *County APCD Rules and Regulations* to regulate sources of air pollution in the county. The pertinent APCD rules are listed below. The emission sources associated with the proposed Project are mobile sources, and therefore, not subject to the APCD rules that apply to stationary sources, such as Regulation VI - New Source Review and Regulation VII - New Source Review of Toxic Air Contaminants.

4.2.3 Significance Criteria

Significance thresholds have been developed by the San Luis Obispo County APCD and contained within its CEQA Air Quality Handbook (San Luis Obispo County APCD, 2003). Specifically, Project emissions are considered potentially significant impacts if any of the following thresholds are exceeded:

1. Operational impact threshold for ROG, NO_x, SO_2, PM_{10} that exceed 10 lbs/day, and for CO that exceed 550 lbs/day. The APCD considers impacts significant and requires more stringent environmental review for projects exceeding 25 lbs/day of ROG, NO_x, SO_2 and PM_{10} emissions, or 550 lbs/day of CO emissions;

2. Construction impact threshold for ROG, NO_X, SO_2, PM_{10} that exceed 185 lbs/day or 2.5 tons/quarter and for PM_{10} emissions that exceed 2.5 tons/quarter. The APCD requires Best Available Control Technology (BACT) for construction equipment for projects with ROG or NO_X emissions between 2.5 and 6.0 tons per quarter and requires BACT plus further mitigation for projects with emissions exceeding 6.0 tons per quarter;

3. The APCD has established health risk threshold values under the Air Toxics “Hot Spots” Information and Assessment Act. These values trigger community notification and a risk reduction plan:

- **Cancer Risk:** ten in one million lifetime cancer risk (continual 70 year exposure);

- **Non-Cancer Acute Hazard:** acute hazard index greater than or equal to 1.0 (sum of acute hazard hourly index of each pollutant with similar adverse health effects);

- **Non-Cancer Chronic Hazard:** chronic hazard index greater than or equal to 1.0 (sum of chronic hazard annual index of each pollutant with similar adverse health effects); and,

4. APCD Rule 402 states "A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property." Violation of Rule 402 is considered a significant impact.

GHG emissions thresholds have not been established at this time by either the State or the San Luis Obispo County APCD. However, evaluation of potential significance will be provided as part of this analysis.

4.2.4 Impact Analysis and Mitigation

The following sections present the air quality impacts likely to result from the proposed Project. Mitigation measures have been included to reduce significant impacts to less than significant levels. Impacts of the Project alternatives and cumulative projects are also discussed in this section.

Impact Discussion

Construction of the proposed Project generates emissions through the use of marine vessels during placement and burial of the cable, construction equipment during shore end and land-based activities, from on-road haul trucks, and from vehicles used by construction workers commuting to and from the Project site.

Overall, construction is anticipated to occur during a one or two calendar quarter period. The total amount of construction emissions on any given day is generally determined by the duration and the intensity of construction activity occurring at any one time. As

such, the emission forecasts provided herein reflect a specific set of conservative assumptions based on the expected construction scenario wherein the duration and number of work days projected for each activity include contingencies. Table 4.2-4 lists the diesel-powered equipment to be used for cable laying, shore end, land-based and support services. The largest type of equipment listed in Table 4.2-4 is the cable lay vessel. Because of these conservative assumptions, actual emissions could be less than those forecasted.

The activities listed in Table 4.2-4 would generally occur consecutively; as a result, the daily emissions generated by these activities would not overlap. Daily emissions would overlap, however, for the following activities:

- Pipe preparation and pre-lay grapnel run activities would occur concurrently for up to three days;
- Nearshore cable installation and shore end construction activities would overlap for one day; and
- Worker commuting would overlap with all activities.

The activity durations provided in Table 4.2-4 are conservative estimates based on previous experience constructing similar projects. The proposed Project would be completed over a six to eight week period.

Table 4.2-5 shows estimated unmitigated daily emissions generated by each project activity. Appendix E includes emission calculation spreadsheets and emission factors used to calculate daily emissions.

Less than Significant Impacts

Operational Impacts. Operation would likely involve occasional inspection and maintenance of the system. Inspections and minor repairs would also be undertaken using an ROV. More major repairs could involve the removal and replacement of cable using a cable laying/repair vessel. Emissions from equipment involved in data collection or maintenance would be relatively minor and would normally be limited to on-road mobile sources or smaller marine vessels, which are subject to state and Federal emission standards and fuel requirements, described above.

Table 4.2-4. Emission-Generating Construction Equipment

Activity/Equipment Type	Number Active	Hours per Day	No. Workdays	Default Hp	Default Load Factor
Pipe Preparation					
Primary Work Boat - Dive Platform	2	14	3	800	0.15
Secondary Work Boat - Anchor Support	2	14	3	350	0.37
Pre-lay Grapnel Run					
Vessel-of-Opportunity - Outside State Waters	2	20	5	800	0.2
Vessel-of-Opportunity - Within State Waters	2	2	2	800	0.2
Offshore Cable Installation					
Cable Lay Vessel - Lay Cable/ Plow Cable	3	24	12	5950	0.25
Cable Lay Vessel - Plow Cable (Within State waters)	3	24	1	5950	0.19
Near-Shore Cable Installation					
Cable Lay Vessel - Landing	2	14	1.5	5950	0.2
Primary Work Boat - Dive Platform	2	14	1	800	0.2
Secondary Work Boat - Anchor Support	2	14	1	350	0.26
Cable Lay Vessel - Near-Shore Lay	2	12	2	5950	0.5
Secondary Work Boat - Support, Shuttle	2	14	2	350	0.5
Near-Shore Cable Retroburial					
Primary Work Boat - Dive Platform	2	14	4	800	0.18
Secondary Work Boat - Anchor Support	2	14	4	350	0.26
Cable Retroburial					
Cable Lay Vessel - Remotely Operated Vehicle (ROV)	3	24	6.5	5950	0.19
Cable Lay Vessel - ROV within State Waters	3	18	1.5	5950	0.19
Shore End Construction					
Bore Rig (Pipe Cleaning)	1	6	1	115	0.5
Crane	1	2	2	250	0.32
Backhoe	1	8	4	105	0.72
Power Winch	1	6	2	100	0.4
Compressor	1	2	2	40	0.48
Generator	1	3	10	50	0.74
Supply Truck	2	1	10	250	0.3

Table 4.2-4. (Continued)

Activity/Equipment Type	Number Active	Hours per Day	No. Workdays	Default Hp	Default Load Factor
Land-Based Cable Pulling for Existing Conduit					
Bobcat Skid Loader	1	10	25	80	0.72
Cable Truck	2	10	25	200	0.5
Pick-up Truck	3	10	25	150	0.5
Generator	2	10	25	50	0.74
Crew Commute Vehicles	**11-person work force, each commutes 50 miles round trip**				

All activities are assumed to occur concurrently with the exceptions described below.
1 Pipe preparation and pre-lay grapnel run activities would occur concurrently for up to three days.
2 Near-shore cable installation and shore end construction activities would overlap for one day.
3 Daily commute of work crew would overlap with all activities.

Source: Jones & Stokes 2008.

The proposed fiber optic cable would consume electricity provided by a network of existing power plants connected to the electrical grid. Emissions from power plants statewide are generally highly regulated and are low compared to the emissions that would occur if a site-specific stationary electrical generator were to be installed. The quantity of NOx and PM_{10} emissions occurring from a power plant operating at the statewide average emission rate would be less than one lb/day for 10 kilowatts (kW) over a 24-hour day (CEC 2003).

The combined operational emissions would not exceed the significance thresholds established by the APCD (Class III).

Objectionable Odors. Construction of the proposed Project would slightly and temporarily increase ambient air pollutant concentrations due to the combustion of diesel fuel. Some individuals may feel that diesel combustion emissions are objectionable, although quantifying the odorous impacts of these emissions to the public is difficult. The mobile nature of most Project emission sources would help disperse those emissions. Additionally, the distance between proposed Project emission sources and the nearest residents is expected to be far enough to allow for adequate dispersion of these emissions to below objectionable odor levels. Therefore, this impact would be less than significant (Class III).

Impact AQ-1: Construction and Decommissioning Emissions

Vessels used for construction and decommissioning could temporarily exceed daily emission thresholds for ozone precursors within the APCD. (Potentially Significant, Class II)

The maximum daily NO_X emissions would occur during nearshore cable installation. This phase of the Project combined with worker commuting will create 2,140 pounds (971 kg) of NO_X per day (lbs/day), which exceeds the APCD regional significance threshold of 185 pounds (84 kg) per day. Offshore cable installation and cable retroburial will also result in NO_X emissions, which will exceed the daily APCD significance threshold. The total duration of activities with emissions above the daily NO_X emissions significance threshold is conservatively estimated to be six days. Forecasted unmitigated daily emissions of ROC, CO, PM_{10}, and SO_2 are less than the APCD thresholds. Mitigation to reduce or offset NO_X emissions is warranted based on the exceedance of the APCD threshold. Decommissioning and cable removal activities have not been identified in detail, but would involve equipment similar to that used for Project construction.

Tables 4.2-5 and 4.2-6 summarize the results of the emission calculations.

Table 4.2-5. Daily Emissions from Construction

Activity	NO_X (pounds/day)	ROC (pounds/day)	PM_{10} (pounds/day)	CO (pounds/day)	SO_2 (pounds/day)
Pipe Preparation	135.3	8.1	3.6	44.4	24.5
Pre-Lay Grapnel Run	12.5	0.78	0.3	4.4	2.2
Offshore Cable Installation*	1601.7	107.8	43.7	590.3	284.9
Near-shore Cable Installation	2140.4	72.1	55.3	484.2	408.3
Near-shore Cable Retro-burial	127.9	7.9	3.5	44.4	23.0
Cable Retro-burial	1201.3	80.9	32.8	442.7	213.7
Shore End Construction	21.1	3.6	1.5	16.2	0.017
Land-Based Cable Pulling	65.7	24.5	6.5	66.5	0.058
Worker Commuting	0.063	24.5	0.048	6.4	--
Total Peak Daily Emissions	2227	63.3	115.8	556.9	408.4
APCD Daily Thresholds	185	185	None	None	None

Notes:

* Only includes activities within State waters.

Not all activities occur concurrently. Peak emissions assumed to include the following worst-case activities: Near-shore cable installation, shore-end construction, and land-based cable pulling.

Source: Jones and Stokes 2008.

Table 4.2-6 shows estimated unmitigated total regional emissions generated by the Project. Appendix E includes emission calculation spreadsheets and emission factors used to calculate total Project emissions. Equipment included in the regional emission estimate includes marine vessels and support boats, on-land construction equipment, on-highway trucks, and worker commute vehicles. The uncontrolled emission estimates for marine vessels are based on pre-2000 emission factors and assume that none of the offshore equipment uses EPA Tier 2-compliant engines. The total NO_X emissions within State waters would be 5 tons (5,080 kg), which exceeds the APCD regional significance threshold for total project emissions during a single calendar quarter by 2.5 tons (2.27 metric tons). Forecast unmitigated total emissions of ROC, CO, PM_{10}, and SO_2 are less than the applicable APCD CEQA thresholds. Mitigation or offsets to reduce NO_X emissions is warranted based on the exceedance of the APCD threshold.

Table 4.2-6. Total Emissions from Construction

Activity	NO_X (tons)	ROC (tons)	PM_{10} (tons)	CO (tons)	SO_2 (tons)
Pipe Preparation	0.20	0.012	0.0055	0.067	0.037
Pre-Lay Grapnel Run	0.012	0.0008	0.0003	0.0044	0.0022
Offshore Cable Installation*	0.80	0.054	0.022	0.30	0.14
Near-shore Cable Installation	1.91	0.058	0.049	0.405	0.367
Near-shore Cable Retro-burial	0.26	0.016	0.00069	0.089	0.046
Cable Retro-burial	6.1	0.41	0.17	2.3	1.1
Shore End Construction	0.041	0.0082	0.0029	0.037	0.00003
Land-Based Cable Pulling	0.82	0.31	0.081	0.83	0.00073
Worker Commuting	0.025	0.03	0.0019	0.26	--
Total Emissions	4.97	0.55	0.19	2.32	0.76
APCD Quarterly Thresholds	2.5	2.5	2.5	NA	NA

Notes:
* Only includes activities within State waters or onshore.
Source: Jones and Stokes 2008.

The terrestrial segment includes an existing conduit system (constructed in 1990) that starts at a manhole (installed in 2001) in the Sandspit Beach parking lot of Montaña de Oro State Park and then traverses inland for a distance of approximately 10.5 miles (16.9 km) to the AT&T San Luis Obispo Cable Station, which was constructed in the 1960s. Beyond the Montaña de Oro State Park boundaries, the conduit system exists entirely within private easements held by AT&T, with the exception of two road crossings at Pecho Valley Road and Clark's Gap Road. This route is commonly referred to as the "ridge" conduit system because it is located along the ridge of the hills just south of Los Osos Valley Road. The terrestrial segment activities include pulling a fiber optic cable and a power cable through the existing conduit system and installing a new ground bed. This segment may also include repairing sections of the conduit system, as necessary, to allow for installation of the new cable. In addition, some minor erosion will be repaired along the route. Other than these activities, no construction is anticipated for this segment of the project.

Mitigation Measures for Impact AQ-1: Construction and Decommissioning Emissions

MM AQ-1a. **Low-Emission Fuel.** Low-sulfur diesel fuel shall be used in all smaller diesel-powered vessels and in all construction equipment.

MM AQ-1b. **Offsite NO_X Mitigation.** As determined by the San Luis Obispo County APCD, AT&T shall financially contribute to an off-site emission reduction program within the APCD jurisdiction. The amount of the contribution shall be agreed upon by the APCD taking into account the limited duration of cable-laying activities. A description of the emission reduction program and a copy of a receipt for funds committed to the program shall be submitted to the APCD prior to operation of the cable.

Rationale for Mitigation

Use of on-road diesel fuel designed for motor vehicles would ensure that combustion-related diesel particulate matter emissions from all construction equipment are reduced to the extent feasible. The CARB currently requires low-sulfur fuel (500 ppm sulfur content) in construction equipment and, in many locations, ultra-low sulfur diesel fuel (15 ppm sulfur content) is already available. In advance of CARB rulemaking, use of on-road diesel fuel in smaller marine vessels (i.e., support boats) would be feasible and appropriate. The cable-laying vessel would operate on heavier distillate and residual fuel oils, which are not available with reduced sulfur content.

Odors from construction equipment diesel exhaust would also be reduced with the recommended use of low-sulfur fuel. No substances used or activities involved with the Project are expected to have the capability to produce offensive odors.

Significant emissions of NOx within the APCD may be mitigated with contributions to previously established programs administered by the APCD. Air quality management plans for attainment partially depend on these programs, which provide emission reductions from sources that are not Project-related and traditionally are not regulated. For example, contributions could be used to fund the Carl Moyer Program (for upgrading or replacing existing engines in agricultural operations or other local marine operations), depending on the discretion of the APCD. The APCD would identify the level of funding necessary to address the impact in a manner consistent with the applicable attainment plan, taking into account the limited duration of cable-laying activities.

Impact AQ-2: Increase in Greenhouse Gas Emissions

The Proposed Project would produce greenhouse gas emissions and contribute to climate change (Potentially Significant, Class II).

Climate Change/Greenhouse Gas Emissions. The proposed action consists of a temporary cable laying project using diesel-powered equipment. Project-related GHG emissions were estimated by the following methods:

- The number of horsepower hours per year of construction equipment usage was estimated based on the equipment inventory listed in Table 4.2-4;
- The number of gallons of diesel fuel used to operate diesel-powered construction equipment was estimated using a factor of 0.05 gallon (0.2 liter) per horsepower-hour using U.S. EPA's NONROAD2005 model (EPA 2005);
- The number of gallons of gasoline used by worker commute vehicles was estimated assuming an average passenger vehicle fuel economy of 20 miles (32 km) per gallon; and
- The following carbon dioxide emission factors for mobile source fuel combustion were used (EIA 2007):
  - Diesel fuel: 22.4 lbs (10.2 kg) per gallon
  - Gasoline: 19.6 lbs (8.9 kg) per gallon

For the GHG analysis only, emission calculations include those associated with cable laying operations beyond the continental shelf to Hawaii and for the cable landing in Hawaii. The inclusion of just the Hawaii to California segment is based on documentation provided by AT&T that demonstrates that this segment of the Asia-America Gateway Project has independent utility and does not depend on the other larger project components for service.

Travel distances for each link of the route from San Luis Obispo to Hawaii are provided in Table 4.2-7. The equipment used for the deep sea work and the Hawaii landing will be substantially similar to the work analyzed for the California portion of the work. The equipment would have similar basic fuel consumption characteristics. Therefore, pounds of CO_2 emitted per mile for each activity or group of emission sources are assumed to be the same for the Hawaii landing. For the deep water link, it is conservatively assumed that the load factor for the cable laying vessel would be similar to the cable laying/plowing for offshore cable installation.

Table 4.2-7. Travel Distances of Links between San Luis Obispo, California, and Hawaii

Cable Project Link		Distance in Miles (km)
San Luis Obispo Cable Landing		
Terrestrial	Land based	9.9 (15.9)
	Shore end	N/A
Construction on continental shelf	Marine support vessels	59.7 (96.1)
	Cable lay vessel	59.7 (96.1)
Deep Water Cable Laying		
	Cable lay vessel	2,486 (4,000)
Hawaii Cable Landing		
Terrestrial	Land based	1.0 (1.6)
	Shore end	N/A
Construction on continental shelf	Marine support vessels	22.3 (35.9)
	Cable lay vessel	22.3 (35.9)

Because the emission sources associated with the proposed Project are internal combustion engines, the predominant GHG emitted by the Project would be carbon dioxide (CO_2). As a result, GHG emissions for the Project are calculated based on estimated fuel usage. Based on a total fuel consumption of 342,776.6 gallons (1.30 million liters), the Project will produce a total of 3,842.8 tons (3.0 million kg) of CO_2. These emissions would occur only during the brief construction period; however, these emissions will result in a net increase in the production of GHG. Such impacts are potentially significant therefore mitigation measures to reduce these impacts are proposed. Emission calculations are included in Table 4.2-8 and in Appendix E. Following construction, the proposed Project would not produce any measurable operational GHG emissions except for those associated with minor maintenance operations which are already occurring as part of the ongoing operations associated with the existing fiber optic cable system.

According to a recent white paper by the Association of Environmental Professionals, "an individual project does not generate enough GHG emissions to significantly influence global climate change. Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHG emissions." The temporary GHG emissions generated by the proposed construction project would be an inconsequentially small fraction of the worldwide GHG emissions during the brief construction period.

Table 4.2-8. Construction Greenhouse Gas Emissions
(Tons, Total Project)

Project Component		Project Total Gallons of Fuel	Project Total CO_2 Emissions in Tons
San Luis Obispo Cable Landing			
Terrestrial	Land based	6,957.5	77.9
	Shore end	312.6	3.5
Construction on continental shelf	Marine support vessels	4,869.3	54.5
	Cable lay vessel	109,001.0	1,219.9
Deep Water Cable Laying			
	Cable lay vessel	178,500.0	1,997.8
Hawaii Cable Landing			
Terrestrial	Land based	434.8	7.8
	Shore end	312.6	3.5
Construction on continental shelf	Marine support vessels	1,826.0	20.4
	Cable lay vessel	40,875.4	4,57.5
Total Project		342,776.6	3,842.8

MM AQ-2. **GHG Emission Offset Program.** The Applicant shall participate in a Carbon Offsets Program and will purchase carbon offsets equivalent to the projected project's GHG emissions to achieve a net zero increase in GHG emissions during the construction phase.

Rationale for Mitigation

Marine vessel emissions have been documented by CARB (2005) as resulting in significant GHG impacts to California's coastal air quality, particularly in areas of high vessel activities including the San Francisco Bay Area and Port of Los Angeles/Long Beach. Project related emissions will result in a temporary increase due to the cable lay vessels engine emissions and associated support vessels. Such emissions are considerably higher from the proposed dynamically positioned cable lay vessel versus a vessel that holds its position by anchoring. By participating in an Emissions Offset Program, these emissions will be offset through implementation of an established emissions reduction program.

Table 4.2-9. Summary of Air Quality Impacts and Mitigation Measures

Impact	Mitigation Measures
AQ-1: Vessels used for construction and decommissioning could temporarily exceed daily emission thresholds for ozone precursors within the APCD. (Class II)	**MM AQ-1a.** Use low-emission fuel in all smaller diesel-powered vessels and in all construction equipment. **MM AQ-1b.** Contribute, as determined by the APCD, to an off-site emission reduction program within the APCD jurisdiction.
AQ-2: The Proposed Project would produce higher greenhouse gas emissions and contribute to climate change (Potentially Significant, Class II).	**MM AQ-2.** The Applicant shall participate in a Carbon Offsets Program and will purchase carbon offsets equivalent to the projected project's GHG emissions to achieve a net zero increase in GHG emissions during the construction phase.

4.2.5 Impacts of Alternatives

The CEQA Guidelines emphasize that a selection of reasonable alternatives and an adequate assessment of these alternatives be presented to allow for a comparative analysis for consideration by decision-makers. Two alternatives are discussed for this EIR: (1) No Project Alternative, and (2) Cable Re-route/Maximum Burial Alternative.

No Project Alternative

Emissions from marine vessels and onshore construction equipment would not occur under this alternative therefore, the No Project Alternative would have no impact on air quality.

Maximum Burial/Cable Re-Route Alternative

This alternative would cause greater emissions from marine vessels for cable laying activities as compared to the proposed Project because the re-route would require additional time to lay the cable along a longer route to achieve overall Project objectives. The construction equipment emissions from onshore activities would be of a similar duration to the proposed Project, which would have a less than significant impact on air quality (Class III). Emissions, including GHGs, from marine vessels would be greater than those of the proposed Project, which would cause a potentially significant impact (Impacts AQ-1 and AQ-2, Class II). Implementation of mitigation measures (MM AQ-1a, MM AQ-1b, and MM AQ-2) would be necessary to reduce the construction impact to a less than significant level.

4.2.6 Cumulative Project Impacts Analysis

Construction of the proposed Project would cause short-term air quality impacts. Construction impacts could overlap with adverse air quality impacts from other cumulative projects in the region. Existing emission sources, Project-related construction, and any overlapping cumulative projects could all jointly contribute to exacerbating existing violations of the ambient air quality standards during the brief construction phase. Because Project emissions alone would contribute substantially to existing violations during the short-term construction phase, the short-term impact (Impact AQ-1) would also be cumulatively considerable (Class II) and mitigation measures (MM AQ-1a and MM AQ-1b) would be necessary to reduce the impact to a less than significant level.

It is possible that GHG emissions associated with construction of the Project, when combined with emissions throughout the Project area, might incrementally contribute to climate change. Locally, there are other industrial, commercial and residential projects in the Project area that could contribute to cumulative impacts. Based upon 9,875 estimated total annual ocean-going vessel visits to California ports (CARB 2005), the additional vessel visits involved in this Project would represent a small percentage increase. As noted in the CARB (2005) analysis, these ocean going vessels cumulatively result in an annual contribution of 3,012,020.15 tons (of CO_2 emissions in California Coastal Waters (CCW). The proposed Project would result in total CO_2 emissions of 3,842.8 tons, which represents less than a quarter of one percent of the total CO_2 emissions from ocean going vessels in CCW.

Global climate change is, by definition, a significant cumulative environmental impact and the impacts of climate change on California's human and natural systems are also significant. But the emissions from this individual project, after mitigation, are infinitesimal compared to the global emissions associated with transportation, energy, and industry. Moreover, the emissions are not continuing but are solely associated with one-time construction. Therefore, the greenhouse gas emissions, following implementation of the proposed mitigation will not result in a significant cumulative impact.

Air quality impacts during operation of the proposed Project (after construction is completed) would be minimal, limited to minor emissions from occasional maintenance, inspection and repair activity, and electricity consumption. As such, no significant cumulative air quality impacts would occur during operation.

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